REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Office Action dated June 26, 2007. In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Status of the Claims

As outlined above, claims 2-3 stand for consideration in this application, wherein claims 2-3 are being amended. All amendments to the application are fully supported therein, including page 9, line 25 – page 10, line 2 of the specification. Applicants hereby submit that no new matter is being introduced into the application through the submission of this response.

Prior Art Rejections

35 U.S.C. §102(b) Rejections

Claims 2-3 were rejected under 35 U.S.C. §102(b) as being anticipated by Gerion et al. (*J. Phys. Chem.* B 2001). Applicants respectfully traverse this rejection for the reasons set forth below.

According to the M.P.E.P. §2131, a claim is anticipated under 35 U.S.C. §102 (a), (b), and (e) only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.

Claim 2

The method as recited in claim 2 is directed to a method for purifying oil-soluble semiconductor nanoparticles. Claim 2 as amended recites that a method for purifying semiconductor nanoparticles, comprises the steps of: modifying semiconductor nanoparticles with oil-soluble materials for surface modification; converting the oil-soluble materials for surface modification into water-soluble materials for surface modification at the interface between an organic solvent and water; shifting the semiconductor nanoparticles from an organic phase to an aqueous phase by the conversion; removing impurities other than semiconductor nanoparticles; setting a wavelength of monochromatic light for size-selective etching to be shorter than a wavelength of absorption edge of the semiconductor

nanoparticles having at least one desired particle size so as to dissolve and peel the surface of the semiconductor nanoparticles by size-selective photoetching, regulate desired particle sizes of the semiconductor nanoparticles and monodisperse the semiconductor nanoparticles; and then applying size-selective photoetching to the semiconductor nanoparticles so as to regulate particle sizes of the semiconductor nanoparticles and monodisperse the semiconductor nanoparticles, the surfaces of which have been modified with the water-soluble materials for surface modification, by irradiating the semiconductor nanoparticles with monochromatic light of the set wavelength.

The Examiner repeatedly asserted that Gerion discloser the process to "photobrighten" the nanoparticles by irradiation of aerated solutions, which encompasses the size-selected photoetching, thereby regulating particle sizes and monodispersing nanoparticles on the grounds that the solution is brightened, and therefore some particles are dissolved and the relative monodisperse particles remain in solution. Applicants strongly but respectfully disagree.

Gerion merely shows the synthesis of water-soluble semiconductor nanoparticles and characterization of their properties. Gerion shows measuring fluorescent emission from the synthesized semiconductor nanoparticles as a method of performing optical characterization of their properties. More precisely, Gerion shows "photobrightening" nanoparticles under CW-laser irradiation for measuring fluorescent emission from the synthesized semiconductor nanoparticles, not dissolving and peeling the surface of the semiconductor nanoparticles by size-selective photoetching. Indeed, Gerion says nothing about some particles being dissolved by photobrightening and the relative monodisperse particles remaining in the solution. Also, the Examiner did not present any evidence to show that some particles are dissolved by Gerion's photobrightening for the fluorescent labeling and that the relative monodisperse particles remain in the solution. Therefore, it cannot be said that size-selective photoetching as recited in claim 2 may read on "photobrightening" shown in Gerion.

Furthermore, Gerion shows that the fluorescence intensity of the silanized nanocrystals are more stable under continuous 488 nm Ar+ laser excitation than dye molecules (page 8865, left column, lines 1-2, Fig. 4). Also, Gerion merely shows in Fig. 5 the measurement results of the size distribution of the synthesized nanoparticles in order to perform size characterization of the synthesized nanoparticles. These showings, however, are irrelevant to determine a wavelength of monochromatic light for size-selective etching so as to dissolve and peel the surface of the semiconductor nanoparticles by size-selective

photoetching, regulate desired particle sizes of the semiconductor nanoparticles and monodisperse the semiconductor nanoparticles. Indeed, Gerion says nothing about setting a wavelength of monochromatic light for size-selective etching to be shorter than a wavelength of absorption edge of the semiconductor nanoparticles having at least one desired particle size so as to dissolve and peel the surface of the semiconductor nanoparticles by size-selective photoetching, regulate desired particle sizes of the semiconductor nanoparticles and monodisperse the semiconductor nanoparticles.

Further, Gerion shows removing the byproducts of the synthesis such as the excess of small complexes and large aggregates. However, Gerion does not show or suggest removing impurities such as nanoparticles modified with a thiol compounds other than semiconductor nanoparticles.

Therefore, Gerion does not show every element recited in claim 2. Accordingly, claim 2 is not anticipated by Gerion.

Claim 3

Claim 3 has substantially the same features as those of claim 2, at least with respect to removing impurities other than semiconductor nanoparticles, setting a wavelength of monochromatic light of to be shorter than a wavelength of absorption edge of the semiconductor nanoparticles having at least one desired particle size so as to dissolve and peel the surface of the semiconductor nanoparticles by size-selective photoetching, and applying size-selecting etching to the semiconductor nanoparticles so as to dissolve and peel the surface of the semiconductor nanoparticles by size-selective photoetching by irradiating the semoconductor nanparticles with monochromatic light of the set wavelength. As such, the arguments set forth above are equally applicable here. Claim 2 being allowable, claim 3 must also be allowable.

35 U.S.C. §103(a) Rejection

Claims 2-3 were rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Gerion in view of Torimoto et al. (*J. Phys. Chem.* B 2001). This rejection is respectfully traversed for the reasons set forth below.

The Examiner asserted that Gerion does not recognize that irradiating the aerated solution causes size-selective etching, but Torimoto teaches that the size-selective photoetching can be principally applied to the preparation of any semiconductor

nanoparticles that are photocorroded under irradiation and it is a useful technique for forming small semiconductor nanoparticles. The Examiner further asserted that an advantage of obtaining selected sizes is to enable the systematic investigation of size-dependent physicochemical properties and therefore, it would have been obvious to one of ordinary skill in the art to use size-selective photoetching, thereby regulating particle sizes, monodispersing them, peeling and converting the material for surface modification in the method of Gerion. Applicants respectfully but strongly disagree.

As set forth above, the function of "photobrightening nanoparticles" in Gerion is clearly different from that of "size-selective photoetching" as recited in claim 2. Torimoto does not show or suggest <u>setting a wavelength of monochromatic light for size-selective etching to be shorter than a wavelength of absorption edge of the semiconductor nanoparticles having at least one desired particle size so as to dissolve and peel the surface of the semiconductor nanoparticles by size-selective photoetching, regulate desired particle sizes of the semiconductor nanoparticles and monodisperse the semiconductor nanoparticles.</u> Furthermore, Torimoto does not show or suggest removing impurities other than the semiconductor nanoparticles before applying size-selective etching to the semiconductor nanoparticles.

Therefore, at the time the invention was made, one of ordinary skill in the art would not and could not achieve all the features as recited in claim 2 by combining Torimoto with Gerion. Accordingly, claim 2 is not obvious in view of all the prior art cited.

<u>Claim 3</u>

Claim 3 has the substantially same features as those of claim 2, at least with respect to removing impurities other than the semiconductor nanoparticles, setting a wavelength of monochromatic light of to be shorter than a wavelength of absorption edge of the semiconductor nanoparticles having at least one desired particle size so as to dissolve and peel the surface of the semiconductor nanoparticles by size-selective photoetching, and applying size-selecting etching to the semiconductor nanoparticles so as to dissolve and peel the surface of the semiconductor nanoparticles by size-selective photoetching by irradiating the semoconductor nanparticles with monochromatic light of the set wavelength. As such, the arguments set forth above are equally applicable here. Claim 2 being allowable, claim 3 must also be allowable.

Conclusion

In light of the Amendments and Remarks, Applicants respectfully request early and favorable action with regard to the present application, and a Notice of Allowance for all pending claims is earnestly solicited.

Favorable reconsideration of this application as amended is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicants' undersigned representative at the address and phone number indicated below.

Respectfully submitted,

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